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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/643,457	08/19/2003	Brian Lester Halla	08211/0200237-US0/P05501	4123
38845 7590 04/19/2007 DARBY & DARBY P.C. P.O. BOX 5257 NEW YORK, NY 10150-5257			EXAMINER LEUBECKER, JOHN P	
			ART UNIT 3739	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE			MAIL DATE	DELIVERY MODE
3 MONTHS			04/19/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

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Office Action Summary	Application No.	Applicant(s)	
	10/643,457	HALLA ET AL.	
	Examiner	Art Unit	
	John P. Leubecker	3739	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 35-39 and 46-63 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 35,37-39,46-59 and 61-63 is/are rejected.
- 7) ☒ Claim(s) 36 and 60 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>2/1/07 & 3/6/07</u> . | 6) <input type="checkbox"/> Other: _____ |

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on January 31, 2007 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 36, 55 and 60 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As to claims 36 and 60, term “the optical circuitry” lacks antecedent basis.

As to claim 55, recitation of a “substrate” in addition to the previously claimed “semiconductor material” (claim 46) ambiguously suggests two separate elements, wherein the specification suggest that these are one in the same (e.g., semiconductor substrate 301).

Claim Rejections - 35 USC § 103

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4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 35, 38, 39, 46-48, 50-59 and 62-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meron et al. (US 2002/0109774) in view of McKenna et al. (U.S. Pat. 6,261,226) and further in view of Yegnashankaran (U.S. Pat. 6,881,943).

Referring mainly to Figures 5-7, and as relevant to claims 46, 47, 50, 51, 52, 58, , Meron et al. disclose a CE comprising a capsule (60) having a curved contour shape (Fig.6) and further including a shell (not numbered but shown as the cross-hatched oval in Fig.6) which includes one or more sensors (64, 64', 64''). Illuminators (63) are associated with each sensor.

Meron et al. fails to disclose that the sensors are curved to the shape of the contour of the shell and include a semiconductor material.

McKenna et al. disclose a device in the pertinent art (endoscopes) having a similar sensor configuration (note plurality of circumferentially facing imaging sensor arrangements 55 in Figure 4) for substantially the same purpose (e.g., 360 degree viewing). Additionally, illuminators (90) are associated with each image sensor. In addition, McKenna et al. teach an alternative embodiment shown in Figures 18-20 wherein elements of the sensors are arranged in continuous bands around the circumference of the wall of the endoscope (Figs.18-20), providing sensors curved to shape to the contour of the outer wall. This embodiment also includes illuminators (330) associated with the sensors. McKenna et al. teaches that such arrangement

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allow viewing of “substantially all locations disposed radially” of the bands (col.21, lines 9-12), which inherently include areas outside of the overlapping field of views of the embodiment with separate spaced apart image sensors (note triangular regions between the field of view cones 65 in Figure 4 of McKenna et al. and in Figure 2B of Meron et al.). This will only improve the nature of the 360 degree viewing and allow elimination of distortion at the edges of such wide fields of view. In view of this teaching, it would have been obvious to one of ordinary skill in the endoscope art at the time of the invention to have considered a sensor arrangement curved around the circumference of Meron et al. as an obvious alternative to the flat, spaced apart sensors to provided a greater degree of 360 degree viewing, as taught by McKenna et al. One of ordinary skill would also readily recognize that such modification would appear to reduce the amount of space required to accommodate separate, flat imaging sensor (Figs. 6 and 7) by disposing the sensors on the shell wall and following the contours of the shell.

And although the Examiner could probably argue that the CCD elements of McKenna et al. inherently include a semiconductor material since the ordinarily skilled artisan would recognize that CCDs are conventionally constructed on such, Yegnashankaran is cited as evidencing that such construction is known (note col.1; lines 6-16, for example). Thus, it would have been obvious to one of ordinary skill in the art to have formed the CCD elements of the Meron et al./McKenna et al. combination proposed above in a conventional manner, which would include a semiconductor material.

As to claims 48, 53 and 54, as Meron et al. and McKenna et al both teach, a lens (62, Meron et al. and col.20, line 67 to col.21, line 1 of McKenna et al.) covers the sensors. Such lens, by placement over the sensors will inherently cover the shell holding the sensors, and will

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meet the limitations of a lens (claim 48), “an outer shell that covers at least a portion of the shell” (claims 53), and “a covering that is applied over at least a portion of the shell) (claim 54).

As to claim 47, imaging sensors are disclosed in both Meron et al. and McKenna et al., yet McKenna et al. teach other sensors can be used (col.14, lines 18-38).

As to claims 55-57, the Examiner takes the position that, since image sensor pixel elements (such as 322 in Figures 18-20 in McKenna et al.) are not free standing elements that have to be individually arranged but are always formed together on a substrate (especially in imaging sensors), that these elements are inherently formed on a substrate that is sufficiently thin to be formed around the wall of the endoscope. In addition, the semiconductor material used to make the image sensor, as taught by Yegnashankaran would anticipate a “substrate”. Furthermore, regarding claims 56 and 57, although it is assumed that the semiconductor wafer taught by Yegnashankaran is made of silicon (since this is most common), Yegnashankaran verifies this in column 4, line 41. Furthermore, the thickness of the wafer, in order to be placed in a curved configuration (col.1, lines 10-16) is one mil (col.3, lines 12-14). Although Meron et al./McKenna et al. does not teach the particulars (e.g., materials, size, etc.), it would be obvious to use what is known in the art, as taught by Yegnashankaran.

As to claims 35, 38, 39, 59, 62 and 63, since Meron et al. and McKenna et al. fail to teach the specifics of forming the curved image sensing element, neither teach a “support” as claimed in claims 35 and 59. Although it could be argued that an image sensor substrate (wafer), in and of itself, is of no use unless connected to operation and processing circuitry, which is usually done via a circuit board (which would anticipate a support), one of ordinary skill, to reduce the Meron et al./McKenna et al. device to practice, would turn to the prior art to “fill in the gaps”.

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Yegnashankaran teaches a curved image sensor (Fig.9, 914,918) secured to a “support” (interconnect layer 912). Interconnect layer (912) forms a circuit board since it conducts voltages to and signals away from the image sensor (col.6, lines 21-23). Without any explanation by Meron et al. and McKenna et al. as to how to implement curved image sensor about the shell, one would obviously consider what is known in the art, and particularly what is taught by Yegnashankaran.

6. Claims 37 and 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meron et al. (US 2002/0109774) in view of McKenna et al. (U.S. Pat. 6,261,226) and Yegnashankaran (U.S. Pat. 6,881,943) and further in view of Inaike et al. (U.S. Pat. 4,508,766).

As described immediately above, the obvious combination of Meron et al., McKenna et al. and Yegnashankaran describe the claimed combination but fail to provide the specifics for the circuit board (interconnect layer 912) in which the image sensor is attached. Again, to reduce the device to practice, one of ordinary skill would turn to the prior art to “fill in the gaps”. Inaike et al. teaches that flexible circuit board substrates are typically and conventionally made from a laminate of polyimide and copper layers. Given no other information as to the make-up of the “interconnect layer 912”, it would have been obvious for one of ordinary skill in the art to have used what is conventional for this structure.

7. Claim 49 is rejected under 35 U.S.C. 103(a) as being unpatentable over Meron et al. (US 2002/0109774) in view of McKenna et al. (U.S. Pat. 6,261,226) and Yegnashankaran (U.S. Pat. 6,881,943) and further in view of Yu (U.S. Pat. 6,300,612).

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The combination of Meron et al./McKenna et al./Yegnashankaran discloses an image sensor made from an inorganic semiconductor (e.g., silicon). Yu teaches that image sensors made from organic semiconductors have been contemplated (note title), are at least an alternative to, if not equivalent, inorganic technology (col.2, line 46 to col.3, line 25), and has advantages over inorganic technology (col.3, lines 41-49). It would have been obvious to one of ordinary skill in the art to have made the imaging sensor in the above described combination from an organic semiconductor in view of the teachings of Yu.

Allowable Subject Matter

8. Claims 36 and 60 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

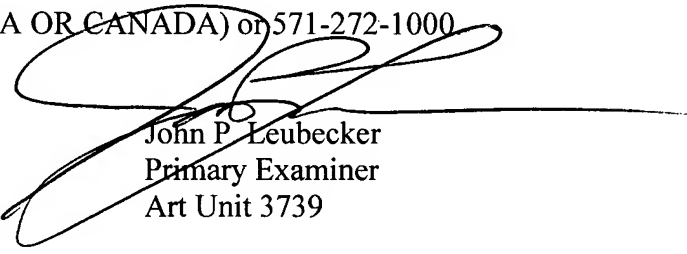
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John P. Leubecker whose telephone number is (571) 272-4769. The examiner can normally be reached on Monday through Friday, 6:00 AM to 2:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Linda C.M. Dvorak can be reached on (571) 272-4764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



John P. Leubecker
Primary Examiner
Art Unit 3739

jpl